

NEW DESCRIPTIONS

TAXONOMIC STUDIES ON SOME INDIAN EULOPHID PARASITES (HYMENOPTERA: CHALCIDOIDEA)¹

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(With four text-figures)

Additional generic characters of pronotum, subgenital plate and external female genitalia are proposed for the genera *Euplectrus* Westwood, *Scotolinx* Ashmead and *Syntomosphyrum* Foerster. One known species of *Euplectrus* (*E. gopimohani* Mani), one known species of *Scotolinx* (*S. quadristriata* Subba Rao and Ramamani) and two new species of *Syntomosphyrum* (*S. udaipurensis* sp. nov. and *S. anomalococci* sp. nov.) are described in detail. Key to species of *Syntomosphyrum* is also provided. Holotypes, paratypes and other material examined by the authors are deposited in Zoological Museum, Aligarh Muslim University, Aligarh, India.

Genus *Euplectrus* Westwood

Euplectrus Westwood, 1832, *Phil. Mag.* 3: 128.

Type-species: *Euplectrus maculiventris* Westwood = *Pteromalus bicolor* Swederus (Monobasic).

The genus *Euplectrus* was proposed by Westwood (1832) for the species *Euplectrus maculiventris* Westwood. The genera *Diplectron* Dahlbom and *Pachyscapha* Howard are generally considered as synonyms of *Euplectrus* Westwood by all recent workers. Recently, Kerrich (1974) synonymized the genus *Rek-
abia* Cameron with *Euplectrus* Westwood. The distinguishing characters of this genus have been given in detail by Nikol'skaya (1952) and Peck *et al.* (1964). Some new generic characters are suggested namely Pronotum with anterior margin deeply concave in mid-

dle, antero-lateral arms long and narrow, posterior margin convex (fig. 1 D); first valvifers triangular with basal and apical angles at different levels (fig. 1 K); third valvulae rudimentary, articulated with second valvifers (fig. 1 L); outer plates of ovipositor narrow at base, broadened at apex (fig. 1 M); subgenital plate of uniform width, anterior margin straight, posterior margin with a notch in middle (fig. 1 N).

Euplectrus gopimohani Mani (Fig. 1 A-N)
Euplectrus gopimohani Mani, 1941, *Indian J. Ent.*, 3: 33.

FEMALE (Redescribed in detail).

Head (fig. 1 A).—Dark with metallic reflections except clypeal region which is yellowish brown, triangular in facial view; frontovertex slightly more than twice as wide as long, width slightly more than half the total head width; ocelli white, arranged in obtuse triangle, lateral ocelli twice their own diameters from orbital margin and less than their own diameters from occipital margin; eyes dark brown and smooth; antennae inserted below lower level

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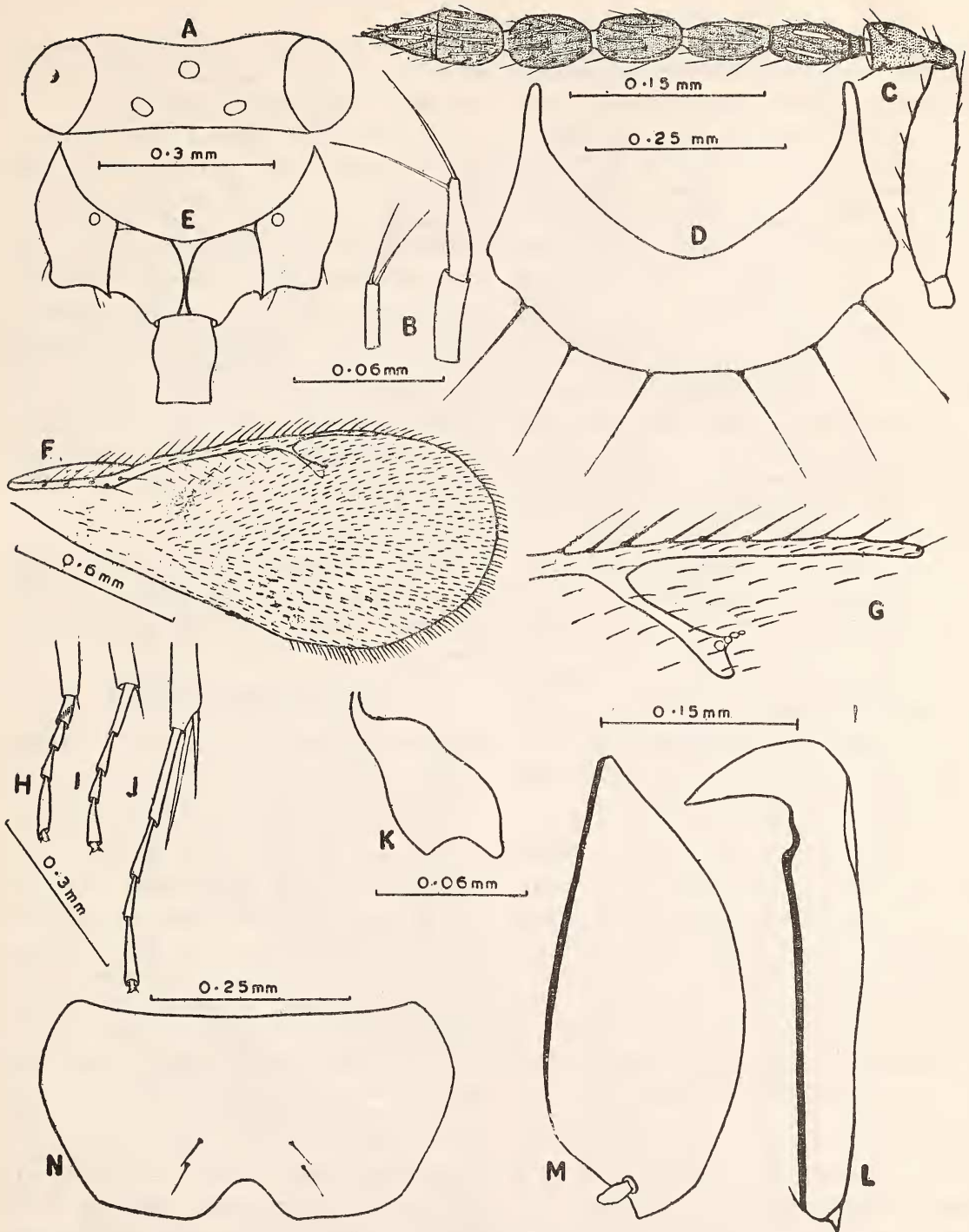


Fig. 1 A-N. *Euplectrus gopimohani* Mani, ♀: (A) Head in dorsal view; (B) Maxillary and labial palpi; (C) Antenna; (D) Pronotum; (E) Propodeum and petiole in dorsal view; (F) Fore wing; (G) Part of fore wing venation; (H) Part of fore leg; (I) Part of Middle leg; (J) Part of hind leg; (K) First valvifer; (L) Second valvifer and third valvula; (M) Outer plate of ovipositor; (N) Subgenital plate.

of eyes; prominence between antennal sockets less than one-third the width of frons between eyes; malar space longer than eye width; malar sutures distinct; maxillary and labial palpi 2 and 1-segmented respectively (fig. 1 B).

Antennae (fig. 1 C).—Brown except scape which is yellow, 8-segmented excluding two ring segments; scape cylindrical, slightly more than four times as long as wide (0.22:0.05 mm); pedicel slightly less than twice as long as wide, slightly longer than first funicle segment; funicle 4-segmented, first shortest and twice as long as wide; segments 2-4 subequal in length, gradually widened distad, each more than one and a half times as long as wide; club 2-segmented, two and a half times as long as wide (0.15:0.06 mm), shorter than preceding two funicle segments together.

Thorax.—Dark with metallic reflections and reticulately sculptured; pronotum with anterior margin deeply concave in middle, antero-lateral arms long and narrow, posterior margin much convex bearing 3 pairs of long setae (fig. 1 D); parapsidal furrows well developed; scutum wider than long; scutellum longer than wide; scutum, parapside and scutellum with 6, 4 and 4 setae respectively; axillae bare; pro-podeum with a median carina (fig. 1 E).

Fore wings (fig. 1 F).—Hyaline, slightly more than twice as long as wide (1.5:0.7 mm); costal cell shorter than marginal vein and with 5 long and 10 small setae; submarginal and marginal veins with 3 and 13 setae respectively; stigmal vein less than one-third the length of marginal vein and one-half the length of postmarginal vein (fig. 1 G); marginal fringe short, spaced by a distance equal to one-third their length.

Hind wings.—Hyaline, five times as long as wide; marginal fringe short, spaced by a distance equal to one-half their length.

Legs (fig. 1 H-J).—Honey yellow; tarsi 4-

jointed; hind legs with two tibial spurs, longest tibial spur shorter than the length of basal two tarsal joints together (fig. 1 J).

Abdomen.—Dark except a broad patch on mid of dorsum which is yellow; petiole one and a half times as long as wide; ovipositor concealed, arising from apical one-third of abdominal venter; first valvifers triangular with basal and apical angles at different levels, basal margin concave (fig. 1 K); second valvifers of uniform width, third valvulae rudimentary, articulated with second valvifers (fig. 1 L); outer plates of ovipositor narrow at base, widened at apex (fig. 1 M); subgenital plate of uniform width, anterior margin straight, posterior margin with a wide notch in middle (fig. 1 N).

Female length: 1.86 mm.

Material examined.—1 ♀, INDIA: Uttar Pradesh, Aligarh, University Campus, ex Lepidopterous Larva, 10.x.1977 (*M. Younus Khan*).

Genus *Scotolinx* Ashmead

Scotolinx Ashmead, 1904, *Mem. Carnegie*

Mus., 1: 354.

Type-species: *Scotolinx gallicola* Ashmead.

The genus *Scotolinx* was proposed by Ashmead (1904) for the species *Scotolinx gallicola* Ashmead. The distinguishing characters of this genus have been given by Ashmead (1904). We suggest some new generic characters which are as follows: Pronotum of uniform width, anterior margin slightly concave in middle, posterior margin straight (fig. 2 E); first valvifers semicircular with basal and apical angles at different levels (fig. 2 H); third valvulae blunt, movably articulated with second valvifers (fig. 2 I); outer plates of ovipositor long, slightly shorter than second valvifers with a mid-longitudinal ridge (fig. 2 J); subgenital plate with anterior margin straight,

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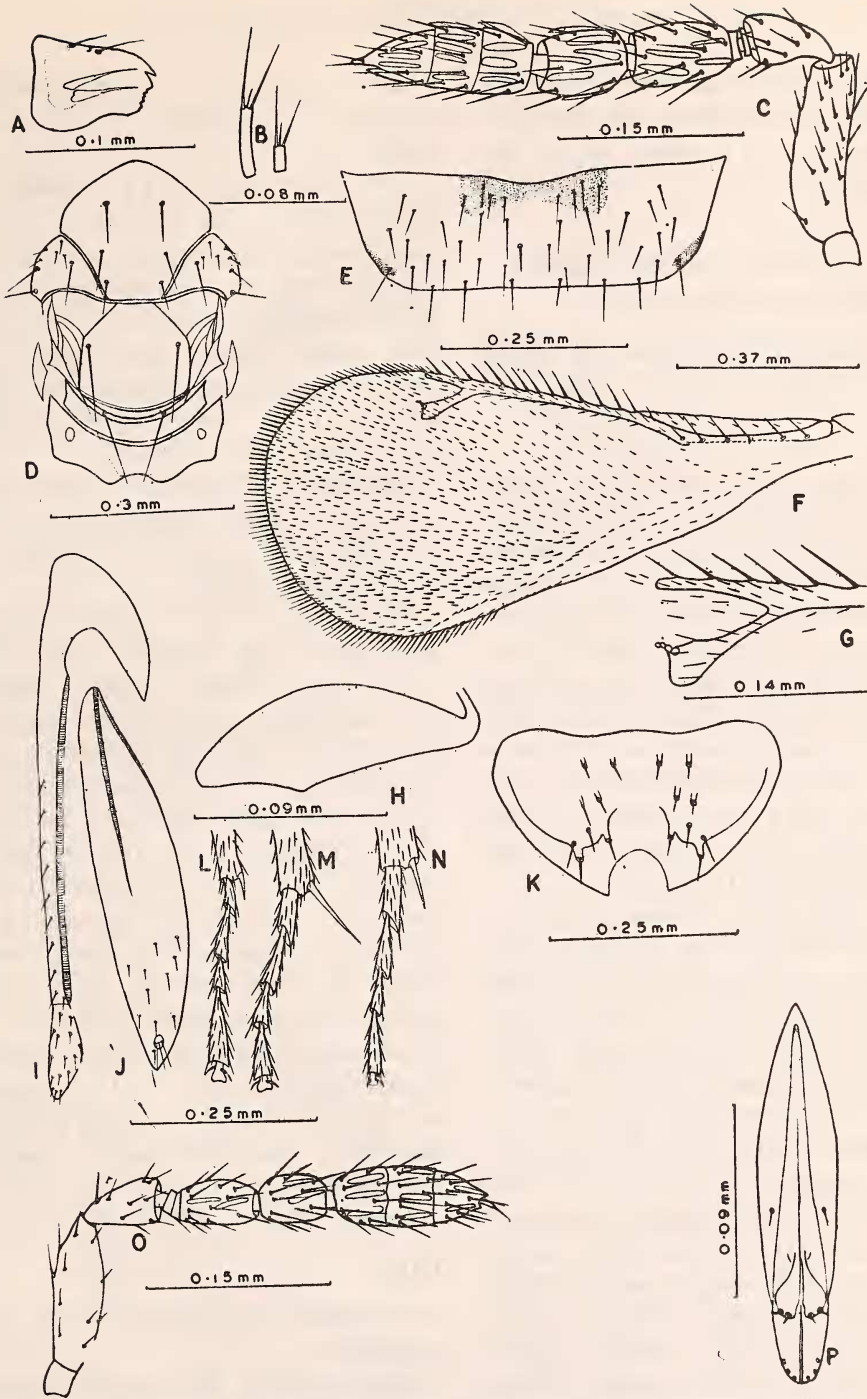


Fig. 2 A-P. *Scotolinx quadristriata* Subba Rao & Ramamani, ♀, ♂: (A) Mandible, ♀; (B) Maxillary and labial palpi, ♀; (C) Antenna, ♀; (D) Propodeum and part of thorax in dorsal view, ♀; (E) Pronotum, ♀; (F) Fore wing, ♀; (G) Part of fore wing venation, ♀; (H) First valvifer, ♀; (I) Second valvifer and third valvula, ♀; (J) Outer plate of ovipositor, ♀; (K) Subgenital plate, ♀; (L) Part of fore leg, ♀; (M) Part of middle leg, ♀; (N) Part of hind leg, ♀; (O) Antenna, ♂; (P) Genitalia, ♂.

posterior margin with a semicircular notch in middle, postero-lateral ridges present (fig. 2 K); male genitalia with gonobase shorter than aedeagus, digitus with two projections (fig. 2 P).

Scotolinx quadristriata Subba Rao and Ramamani (Fig. 2 A-P)

Scotolinx quadristriata Subba Rao and Ramamani, 1965, *Indian J. Ent.* 27: 412.

FEMALE

Head.—Orange yellow and setose, slightly wider than long in facial view (0.28:0.23 mm); frontovertex wider than long, width about one-half the total head width; ocelli red, arranged in obtuse triangle, lateral ocelli twice their own diameters from orbital margin and their own diameters from occipital margin; eyes red and smooth; malar sutures distinct; malar space longer than eye width; antennae inserted at lower level of eyes; mandibles bidentate with one acute tooth and a broad truncation having serrations (fig. 2 A); maxillary and labial palpi each 1-segmented (fig. 2 B).

Antennae (fig. 2 C).—Yellowish brown, 7-segmented excluding 2 ring segments; scape flattened, slightly more than three times as long as wide, about as long as club; pedicel one and a half times as long as wide, slightly shorter than first funicle segment; funicle 2-segmented, first funicle segment slightly more than one and a half times as long as wide, longer than second; club 3-segmented, two and a half times as long as wide, slightly shorter than funicle.

Thorax (fig. 2 D).—Orange yellow pronotum of uniform width, anterior margin straight, slightly concave in middle, antero-lateral angles acute, posterior margin straight bearing 4 pairs of setae (fig. 2 E); parapsidal furrows complete; scutum and scutellum with 6 and

4 setae respectively; mesopostphragma well developed, not reaching beyond the propodeum.

Fore wings (fig. 2 F).—Hyaline slightly more than twice as long as wide (1.26:0.58 mm); costal cell as long as marginal vein and with 11 small setae; submarginal vein with 5 setae; marginal vein with 12 setae; postmarginal slightly shorter than stigmal and one-fourth the length of marginal vein (fig. 2 G); marginal fringe spaced by a distance equal to one-fourth their length.

Hind wings.—Hyaline, five and a half times as long as wide; marginal fringe one-third the wing width, spaced by distance equal to one-fifth their length.

Legs (fig. 2 L-N).—Yellow; middle tibial spur longer than basitarsus (fig. 2 M).

Abdomen.—Yellow, except dorsum with four transverse brown bands, slightly longer than thorax; ovipositor slightly exserted, arising from base of abdominal venter; first valvifers semicircular, with basal and apical angles at different levels (fig. 2 H); anterior margin of basal part of second valvifers much curved, U-shaped; third valvulae two and a half times as long as wide, about one-fifth the length of second valvifers (fig. 2 I); outer plates of ovipositor long, widened in middle with mid-longitudinal ridge, shorter than second valvifers (fig. 2 J); subgenital plate with anterior margin straight, posterior margin with a semicircular notch in middle, postero-lateral ridges present (fig. 2 K).

Female length: 1.38 mm.

MALE

Resembles female except in the following characters:

Male genitalia with gonobase shorter than aedeagus, digitus short, each with two pro-

jections (fig. 2 P).

Male length: 0.98 mm.

Material examined: 2 ♀, 1 ♂, INDIA: Rajasthan, Udaipur, ex leaf mining Lepidoptera on *Citrus* sp., 1.x.1975 (M. Younus Khan).

Genus *Syntomosphyrum* Foerster

Syntomosphyrum Foerster, 1878, *Verhandl. Naturhist. Ver. Preuss. Rheinl. u. Westfalens*, 35: 60.

Type-species: *Syntomosphyrum fulvipes* Foerster (Monobasic).

The genus *Syntomosphyrum* was proposed by Foerster (1878) for the species *S. fulvipes* Foerster. Muesebeck *et. al.* (1951) considered the genus *Tetrastichopsis* Girault to be a synonym of *Syntomosphyrum* Foerster. Recently, *Syntomosphyrum* Foerster was synonymized with *Aprostocetus* Westwood by Graham (1961) and with *Tetrastichus* Haliday by Domenichini (1965). However, Waterston (1915 a & b), Ferrière (1933, 1940). Muesebeck *et al.* (1951), Kurian (1954), Burks (1952, 1967), Risbec (1957), Peck (1963) and Peck *et al.* (1964) recognized *Syntomosphyrum* as a valid genus. They separated it from its closely allied genera by the absence of longitudinal grooves on scutum and scutellum. We have followed earlier workers in treating *Syntomosphyrum* as a valid genus. This view gets support from Kerrich's (1969) separation of *Platocharis* Kerrich and *Schizocharis* Kerrich on the basis of the presence or absence of scutellar grooves. Some new generic characters are suggested namely Pronotum with anterior margin deeply concave, posterior margin straight or slightly curved (fig. 3 F; fig. 4 D); third valvulae movably articulated with second valvifers (fig. 3 I; fig. 4 H); posterior margin of subgenital plate with a notch in middle (fig. 3 K; fig. 4 J); male genitalia with

gonobase longer than aedeagus, digitus short, each with single projection (fig. 3 N).

KEY TO SPECIES OF *Syntomosphyrum* FOERSTER, BASED ON FEMALES

1. Funicle segments subquadrate or longer than wide.....2
- Funicle segments transverse; first funicle segment with two sensoria; bristle to spur of club as long as or longer than the last club joint.....*S. indicum* Silvestri
2. Pedicel longer than first funicle segment.....3
- Pedicel as long as or shorter than first funicle segment.....4
3. Abdomen shorter than head and thorax together; antennae with 2 ring segments; vertex smooth; body aeneous black.....*S. javanicum* Ferriere
- Abdomen as long as head and thorax together; antennae with 3 ring segments; vertex finely punctate; body orange yellow.....*S. obscuriceps* Ferriere
4. Pedicel shorter than first funicle segment; first funicle segment more than one and a half times as long as wide; thorax brown or yellow, non-metallic; submarginal vein with 3 or 4 setae...5
- Pedicel as long as first funicle segment; first funicle segment as long as wide; thorax dark brown; submarginal vein with 2 setae.....*S. taprobanes* Waterston
5. Thorax brown; scutum with 16 longitudinal ridges anteriorly and with a row of 4 setae near each parapsidal furrow (fig. 3 E); first funicle segment less than twice as long as wide, second and third each slightly longer than wide; club much longer than preceding two funicle segments together; submarginal vein with 3 setae; first valvifers with basal and apical angles at different levels (fig. 3 H).....*S. udaipurensis* sp. nov.
- Thorax yellow; scutum with 4 or 5 longitudinal ridges anteriorly and with 8 setae irregularly arranged near each parapsidal furrow (fig. 4 C); first funicle segment more than twice as long as wide, second and third each twice as long as wide; club as long as preceding two funicle segments together; submarginal vein with 4 setae; first valvifers almost semicircular with basal and

apical angles in one plane (fig. 4 G).....
*S. anomalococci* sp. nov.

Syntomosphyrum undaipurensis sp. nov.
 (Fig. 3 A-N)

FEMALE

Head (fig. 3 A).—Brown, wider than long in facial view; frontovertex width more than one-half the total head width; ocelli yellowish, arranged in obtuse triangle, lateral ocelli slightly more than their own diameters from orbital and less than their own diameters from occipital margins; eyes red and smooth; malar space longer than eye width; malar sutures distinct; antennae inserted above lower level of eyes; prominence between antennal sockets about one-fourth the width of frons between eyes; mandibles tridentate with apical tooth long and acute, mesal small and acute, lower rudimentary (fig. 3 B); maxillary and labial palpi each 1-segmented (fig. 3 D).

Antennae (fig. 3 C).—Brownish, except scape and apical half of pedicel which are yellow; 8-segmented excluding 2 ring segments; scape cylindrical, slightly more than three times as long as wide (0.10:0.03 mm); pedicel one and a half times as long as wide, shorter than first funicle segment; funicle 3-segmented; segments 1-3 gradually decreasing in length distad; first funicle segment longest, more than one and a half times as long as wide, second and third slightly longer than wide; club 3-segmented, much longer than preceding two funicle segments together.

Thorax (fig. 3 E).—Brown; pronotum broad, antero-lateral angles acute, posterior margin straight, lateral margin of each side with a small protuberance, posterior submarginal ridge absent (fig. 3 F); scutum slightly wider than long with 16 longitudinal ridges anteriorly and a row of 4 setae near each

parapsidal furrow; each parapside with single seta; scutellum wider than long and with two pairs of setae; scutum and scutellum without longitudinal grooves; propodeum with a median carina diverging backwards.

Fore wings (fig. 3 G).—Hyaline, slightly more than twice as long as wide (0.85:0.4 mm); costal cell long and narrow, slightly shorter than marginal vein and with 8 small setae; submarginal and marginal veins with 3 and 11 setae respectively; postmarginal vein rudimentary; marginal fringe short, spaced by a distance equal to one-fourth their length.

Hind wings.—Hyaline, four times as long as wide; marginal fringe spaced by a distance equal to one-fourth their length.

Legs.—Yellow; tarsi 4-jointed; mid tibial spur shorter than basitarsus.

Abdomen.—Dark brown except base which is yellow, as long as head and thorax together; ovipositor slightly exserted, arising from near base of abdominal venter; first valvifers semicircular with basal and apical angles at different levels (fig. 3 H); third valvulae five times as long as wide, slightly less than one-half the length of second valvifers (fig. 3 I); outer plates of ovipositor long and of uniform width (fig. 3 J); subgenital plate with anterior margin slightly concave, posterior margin semicircular with a notch in middle (fig. 3 K).

Female length: 1.07 mm.

MALE

Resembles female except in the following characters:

Body yellowish brown; antennae (fig. 3 M) 9-segmented; scape slightly flattened, two and a half times as long as wide; pedicel slightly longer than wide, longer than first funicle segment; funicle 4-segmented, each segment with a whorl of long hairs; first funicle segment

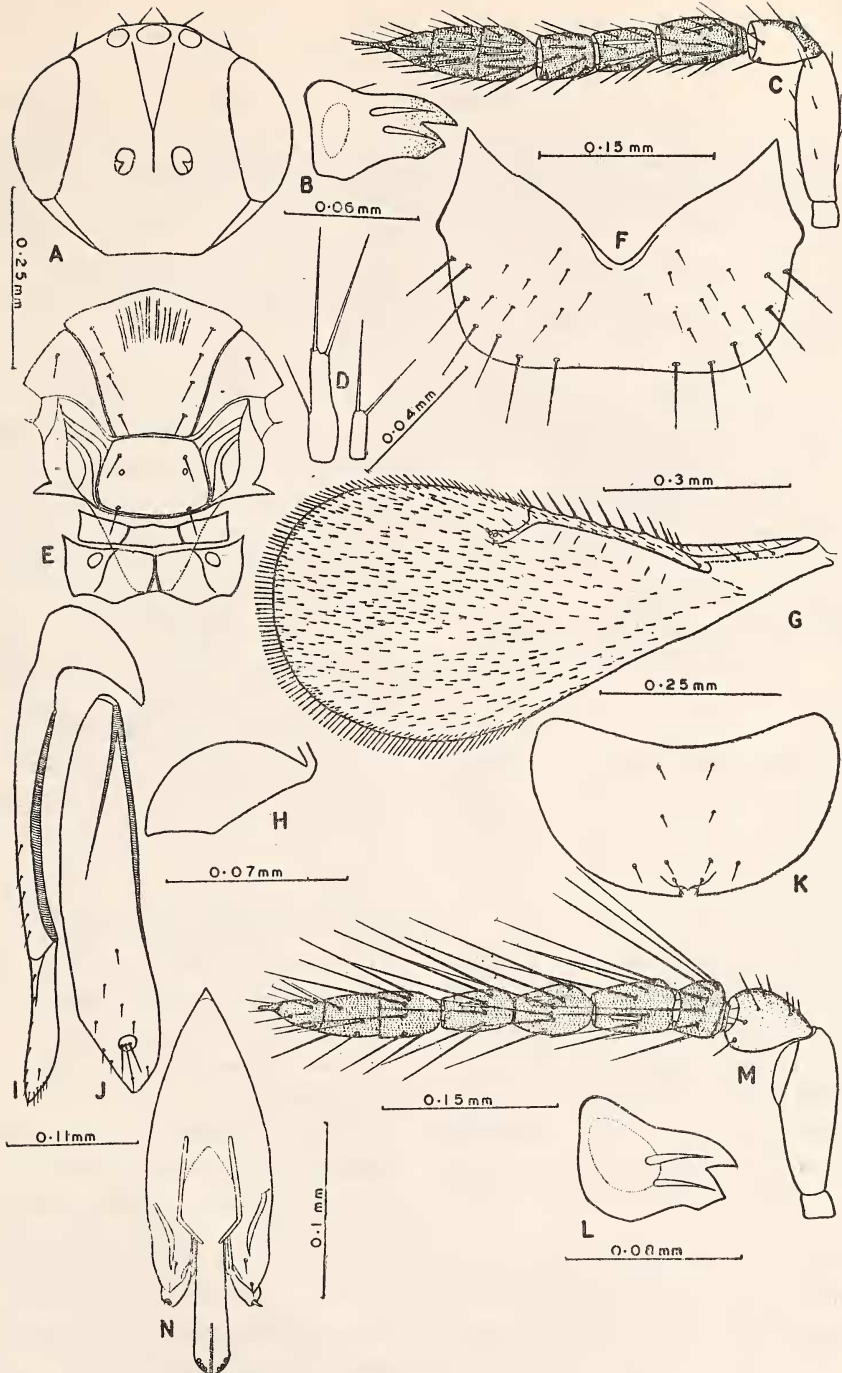


Fig. 3 A-N. *Syntomosphyrum udaipurensis* sp. nov., ♀, ♂: (A) Head in facial view, ♀; (B) Mandible, ♀; (C) Antenna, ♀; (D) Maxillary and labial palpi, ♀; (E) Propodeum and part of thorax in dorsal view, ♀; (F) Pronotum, ♀; (G) Fore wing, ♀; (H) First valvifer, ♀; (I) Second valvifer and third valvula, ♀; (J) Outer plate of ovipositor, ♀; (K) Subgenital plate, ♀; (L) Mandible, ♂; (M) Antenna, ♂; (N) Genitalia, ♂.

slightly wider than long, one-half the length of second segment, segments 2-4 subequal in length, each distinctly longer than wide; club four times as long as wide; male genitalia with gonobase two and a half times as long as wide, longer than aedeagus, anterior margin of basal part much acute, digitus with a small projection, aedeagal shaft long (fig. 3 N).

Male length: 0.96 mm.

Holotype ♀. INDIA: Orissa, Bhubaneswar, ex eggs of Fulgorid on *Ficus* sp., 4.ix.1975 (*M. Younus Khan*).

Paratypes. 4 ♀, 3 ♂ (same data as holotype); 10 ♀, Rajasthan, Udaipur, ex eggs of *Pyrilla* sp. on *Saccharum officinarum* Linn., 10.viii.1977 (*M. Younus Khan*).

Syntomosphyrum anomalococci sp. nov.

(Fig. 4 A-J)

FEMALE

Head.—Yellowish except ocellar and postoccipital regions which are dark brown, slightly wider than long in facial view; frontover-
tex width slightly less than one-half the total head width; ocelli white, arranged in equilateral triangle; lateral ocelli less than their own diameters from orbital and occipital margins separately; eyes red and smooth; antennae inserted above lower level of eyes; prominence between antennal sockets one-third the width of frons between eyes; malar sutures distinct; malar space shorter than eye width; mandibles tridentate with apical tooth long and acute (fig. 4 A); maxillary and labial palpi each 1-segmented.

Antennae (fig. 4 B).—Yellowish brown except scape which is yellow, 8-segmented excluding 2 ring segments; scape slightly flattened, slightly more than two and a half times as long as wide (0.13:0.05 mm); pedicel one and a half times as long as wide, shorter than

first funicle segment; funicle 3-segmented, segments 1-3 gradually decreasing in length distad; first funicle segment slightly more than twice as long as wide, second and third each twice as long as wide; club 3-segmented, slightly less than four times as long as wide, as long as preceding two funicle segments together.

Thorax (fig. 4 C).—Yellow; pronotum broad with an infuscated patch in middle, antero-lateral angles acute, lateral margin of each side with small protuberance, posterior margin straight, posterior submarginal ridge absent (fig. 4 D); scutum slightly longer than wide, bearing 5 longitudinal ridges anteriorly and 8 irregularly arranged setae near each parapsidal furrow; each parapside with 7 setae; scutum and scutellum without longitudinal grooves; scutellum with 2 pairs of setae; propodeum with a median carina diverging backwards.

Fore wings (fig. 4 E).—Hyaline, about twice as long as wide; costal cell shorter than marginal vein; submarginal and marginal veins with 4 and 11 setae respectively (fig. 3 F); marginal fringe short, spaced by distance equal to one-third their length.

Hind wings.—More than four times as long as wide; marginal fringe spaced by a distance equal to one-third their length.

Legs.—Yellowish; mid tibial spur shorter than basitarsus.

Abdomen.—Yellow except dorsum with transverse brown bands, longer than thorax; ovipositor slightly exerted, arising from near base of abdominal venter; first valvifers almost semicircular with basal and apical angles in one plane (fig. 4 G); third valvulae long, six times as long as wide, less than one-half the length of second valvifers (fig. 4 H); outer plates of ovipositor long and of uniform width (fig. 4 I); subgenital plate of uniform width,

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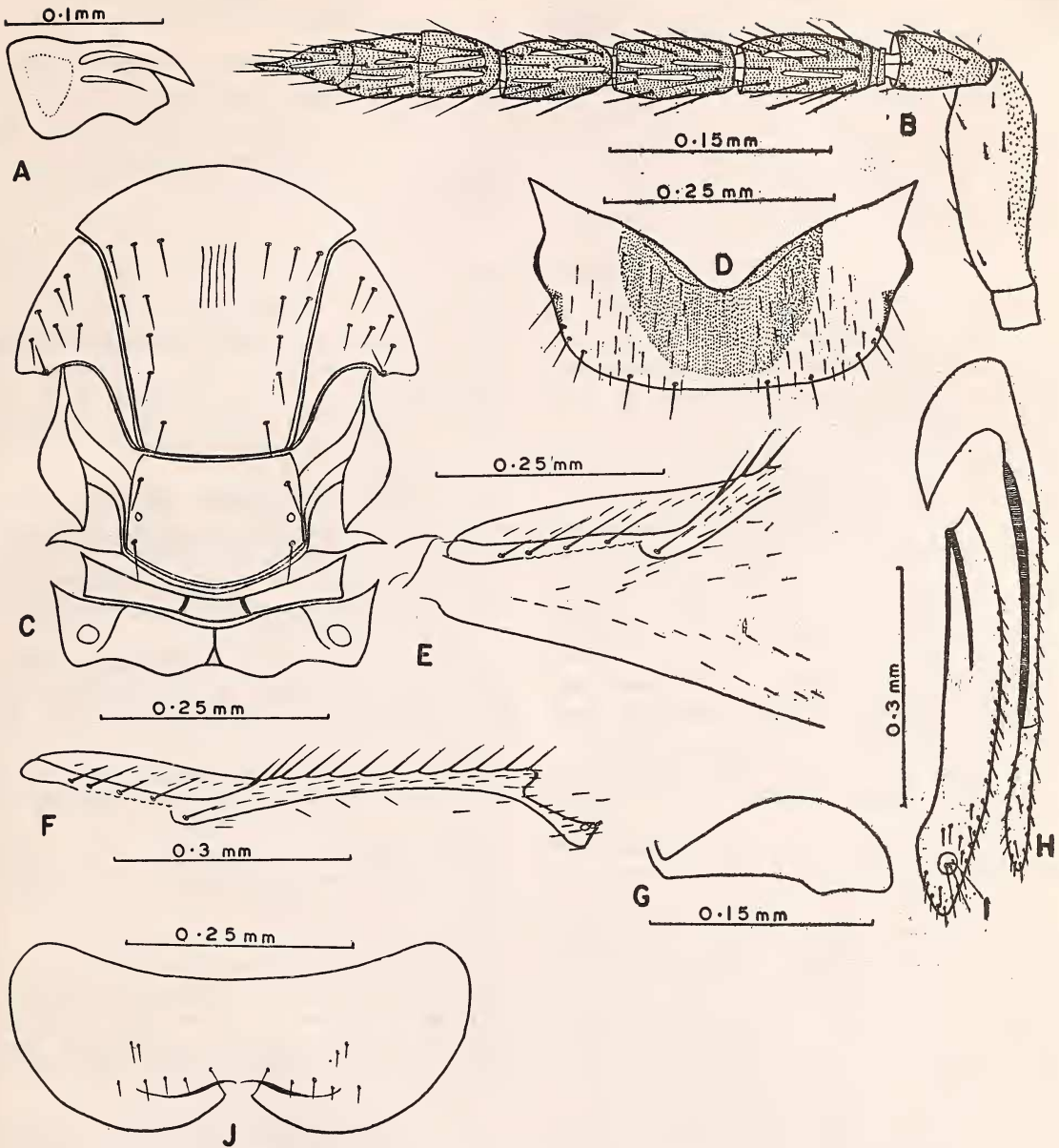


Fig. 4 A-J. *Syntomosphyrum anomalococci* sp. nov., ♀: (A) Mandible; (B) Antenna; (C) Propodeum and part of thorax in dorsal view; (D) Pronotum; (E) Basal part of fore wing; (F) Fore wing venation; (G) First valvifer; (H) Second valvifer and third valvula; (I) Outer plate of ovipositor; (J) Subgenital plate.

anterior margin slightly concave, posterior margin semicircular with a notch in middle (fig. 4 J).

Female length: 1.4 mm.

Holotype ♀. INDIA: Tamil Nadu, Vellore, ex *Anomalococcus cremastogastri* Green on *Acacia* sp., 4.i.1976 (*M. Younus Khan*).

Paratypes 15 ♀ (same data as holotype).

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